LERNAEODISCUS PUSILLUS NOV. SPEC., A RHIZOCEPHALAN PARASITE OF A *PORCELLANA* FROM EGYPT

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In 1936 Dr. Isabella Gordon kindly sent me twelve specimens of Rhizocephalan parasites on Porcelain Crabs collected by Dr. R. Gurney in coral rock on the Harbour Reef near Ghardaqa, Red Sea, Egypt. The hosts of these parasites were provisionally identified as *Porcellana serratifrons* of Nobile, *nec* Stimpson. The parasites appear to represent a hitherto undescribed species.

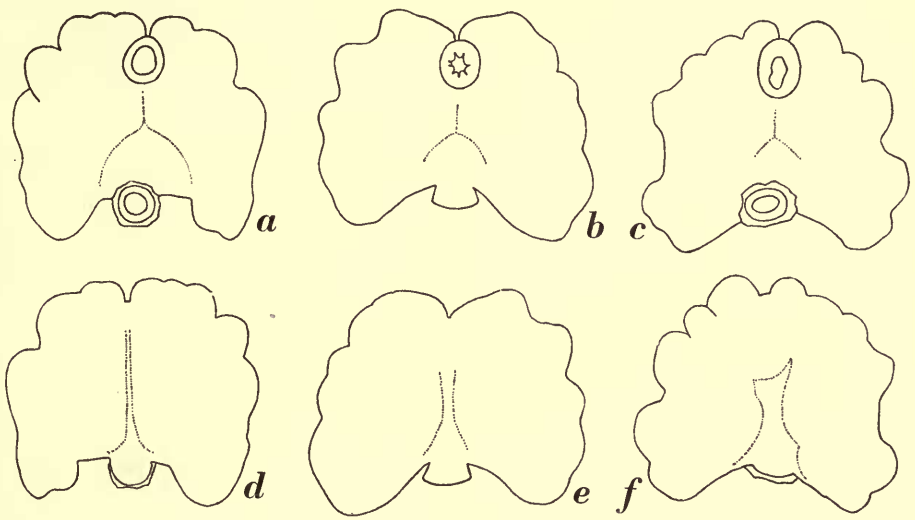

Fig. 1. *Lernaeodiscus pusillus*: *a–c*, dorsal view of three specimens, mantle opening in the upper part, stalk in the lower part of the figures; *d–f*, ventral view of the same specimens. × 18.

The animals are of very small size, their greatest diameter being about 2 mm., their antero-posterior diameter (in the median plane) about 1½ mm., and their smallest (dorso-ventral) diameter less than 1 mm. The total diameter in the antero-posterior direction is, as a rule, slightly less than the greatest diameter. The outlines of three specimens in dorsal view are given in Fig. 1*a–c*, in ventral view in Fig. 1*d–f*. The shape of the parasites is more or less roundish or somewhat trapezoid or triangular; their contour is slightly irregular as the mantle shows a number of rather inconspicuous lappets. The comparatively wide mantle opening, which is surrounded by a well-developed muscular wall, is found on the anterior region of the dorsal surface. As a rule the dorsal surface shows a system of three shallow grooves running from

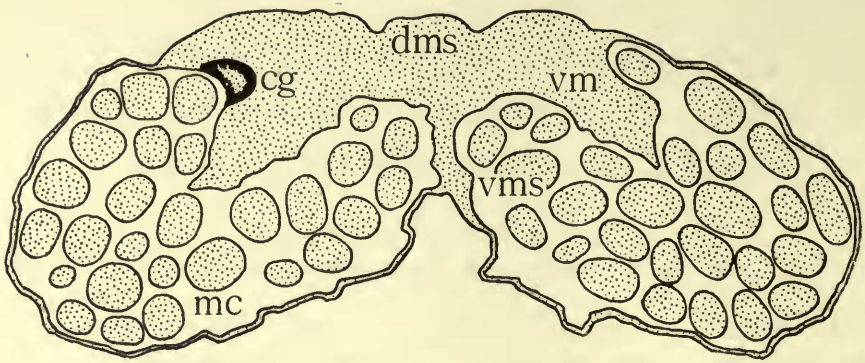

FIG. 2. *Lernaeodiscus pusillus*, specimen of Fig. 1*a*, *d*. Transverse section showing one of the colleteric glands (*cg*). *dms*, dorsal mesentery; *mc*, mantle cavity; *vm*, visceral mass; *vms*, ventral mesentery. ×60.

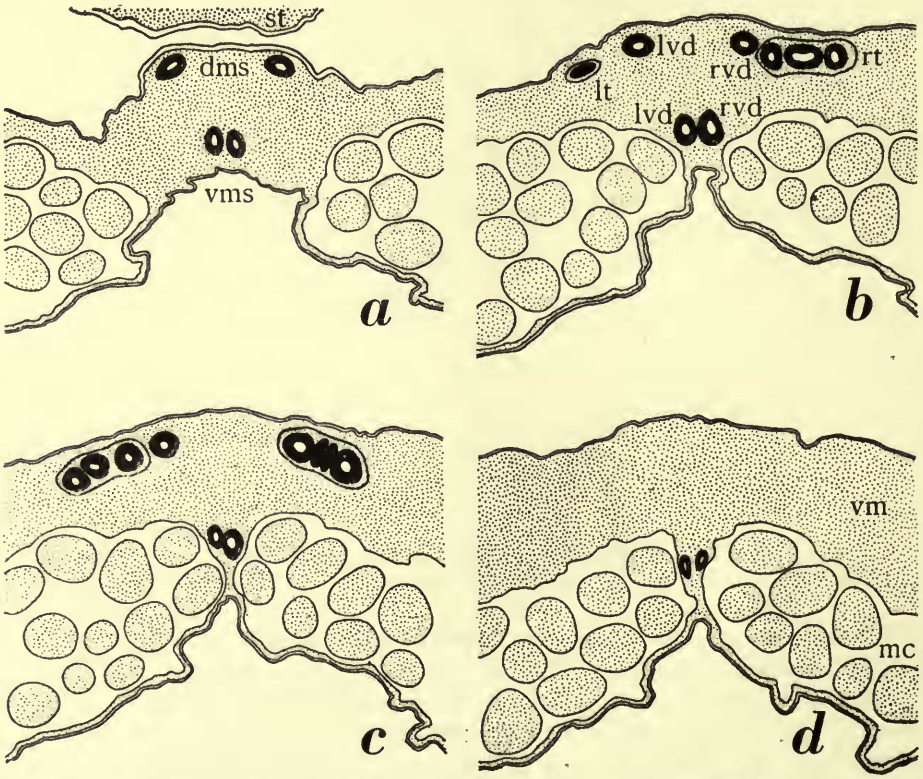

FIG. 3. *Lernaeodiscus pusillus*, specimen of Fig. 1*a*, *d*. Central parts of transverse sections, *a* from a region not far from the stalk, each following section from a more anterior region. *dms*, dorsal mesentery; *lt*, left testis; *lvd*, left vas deferens; *mc*, mantle cavity; *rt*, right testis; *rvd*, right vas deferens; *st*, stalk; *vm*, visceral mass; *vms*, ventral mesentery. ×64.

the centre to the mantle opening and to the lateral parts of the posterior region of the body. On the ventral surface there is a distinct groove running from the stalk in an anterior direction; this groove varies in length and in breadth.

The three specimens shown in Fig. 1 were sectioned transversely for the study of their internal structure. In sections from the region about half-way between the stalk and the mantle opening the colleteric glands are found; as a rule one of these is situated more anteriorly than the other. These glands (Fig. 2, *cg*) are more or less cup-shaped small cavities surrounded by an epithelium with a stronger affinity for stains than the surrounding parts. The figure further shows that the dorsal surface of the visceral mass is broadly attached to the mantle, in this way forming the so-called dorsal mesentery. On the other side the visceral mass is connected with the mantle by means of a real mesentery, the ventral mesentery. Where the latter is attached to the mantle there is, externally, the longitudinal groove referred to above.

In the three sectioned specimens the colleteric glands entirely agree with one another in shape, their position in the visceral mass, and their size. The male organs in two of the sectioned specimens are also similar in every respect (Fig. 3), but in the third specimen (Fig. 4) they are slightly more complicated.

The male organs closely correspond with those of *Lernaeodiscus okadai* Boschma (cf. van Baal, 1937, figs. 18–21). The male openings, in a region about half-way between the stalk and the mantle opening, are found on each side of the ventral mesentery (Fig. 4*d*, *e*). The vasa deferentia run along the ventral mesentery until they reach the posterior part of the visceral mass. Here they turn towards the dorsal surface (Figs. 3*a*, 4*a*), and continue their course along the dorsal mesentery in an anterior direction. After the vasa deferentia have passed into the testes the latter extend in a lateral direction, so that the terminal part of the testes is the most lateral part of the male organs (Fig. 3*b*, *c*).

As remarked above, the male organs in two of the sectioned specimens have a similar shape (as represented in Fig. 3); in the third specimen the male organs show some differences. Here the left testis (Fig. 4*d*, *e*) does not extend in a lateral direction, whilst the terminal part of the right testis after continuing its course in a lateral direction towards the right margin of the visceral mass (*a* in Fig. 4) obtains a curved shape by extending towards the median plane again (*p* in Fig. 4). The closed end of this testis consequently lies next to the right vas deferens (Fig. 4*b*).

Besides having a course in a lateral direction the testes in all the three specimens are strongly contorted, so that in sections they appear to be divided into numerous smaller parts.

It is rather difficult to define the characters by which *Lernaeodiscus pusillus* can be distinguished from the other species of the genus that are, like the new species, parasites of Porcelain Crabs, viz. *L. porcellanae* Müller (cf. Müller, 1862; Boschma, 1931) and *L. okadai* Boschma (cf. Boschma, 1935; van Baal, 1937).

The external shape of *Lernaeodiscus porcellanae* seems to be rather constant, the animal having well-developed lappet-like expansions of the mantle. But too few specimens are known to establish this peculiarity as a constant character for full-grown as well as immature specimens. In *L. okadai*, van Baal (1937) has shown that the external shape is subject to a very large amount of variation. Here, as a rule,

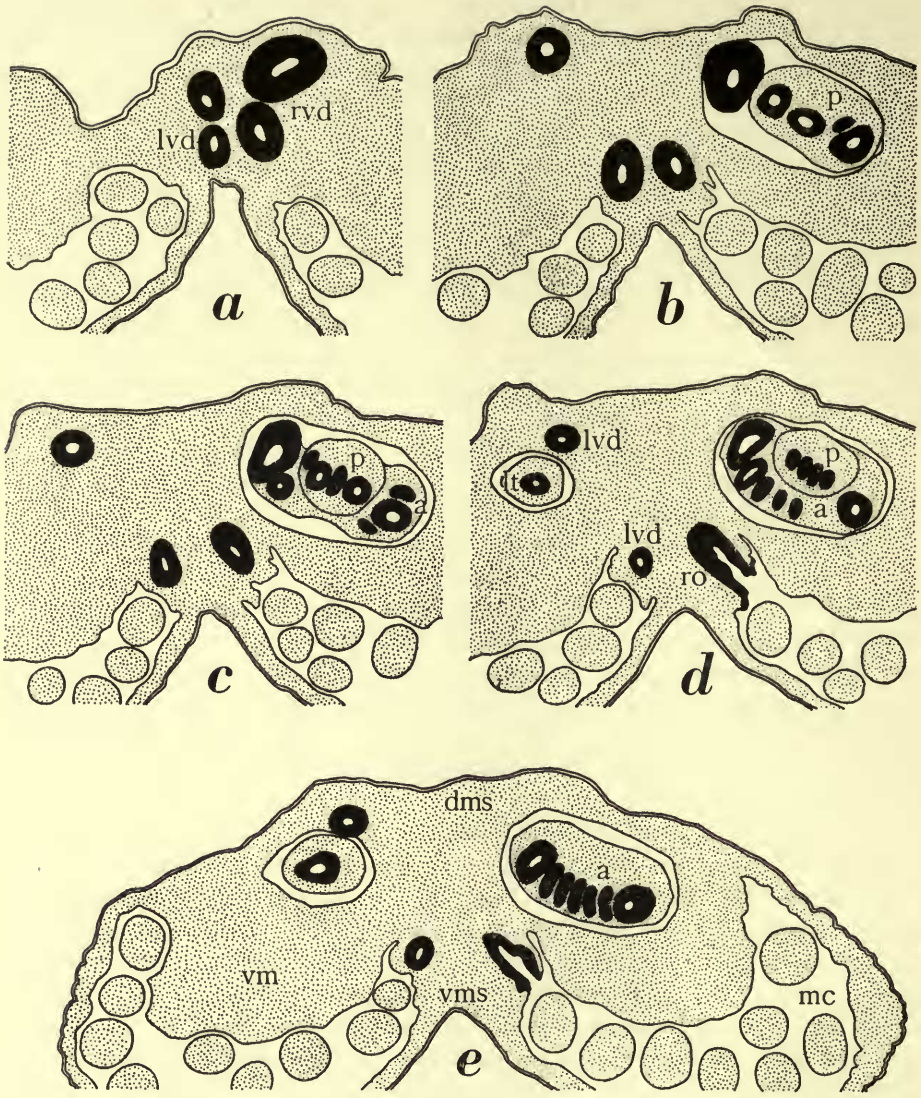

FIG. 4. *Lernaeodiscus pusillus*, specimen of Fig. 1*c*, *f*. Central parts of transverse sections, *a* from a region not far from the stalk, each following section from a more anterior region. *a*, anterior part of right testis; *dms*, dorsal mesentery; *lt*, left testis; *lvd*, left vas deferens; *mc*, mantle cavity; *p*, posterior part of right testis; *ro*, right male genital opening; *rvd*, right vas deferens; *vm*, visceral mass; *vms*, ventral mesentery. ×64.

the lappets do not occur in young specimens but are generally distinct in mature animals. The specimens of *L. pusillus* have, as far as their external shape is concerned, a rather constant appearance.

The colleteric glands in the genus *Lernaeodiscus* are of such a simple structure that they cannot furnish characters for specific distinction.

The male genital organs are, to a large degree, subject to individual variation, as is evident from van Baal's (1937) elaborate researches on numerous specimens of *L. okadai*.

The only remaining distinctive character is that of the size of the animals. On this character *L. porcellanae*, by its comparatively large size, is at once distinguished from *L. okadai* and *L. pusillus*. In *L. pusillus* the greatest diameter is about 2 mm., and the total length is but slightly smaller. The sectioned specimens are fully mature, as their mantle cavities contain large quantities of eggs. For *L. okadai* there are the following data (the numbers giving the length and the greatest transverse diameter in mm.) recorded by van Baal (1937):

$2\frac{1}{2}\times3$ (small number of eggs); $4\times5\frac{1}{2}$ (no eggs); $4\frac{1}{2}\times5$ (small number of eggs); 4×5 (large number of eggs); $2\frac{3}{4}\times3\frac{1}{2}$ (very small number of eggs); $1\frac{1}{2}\times2$ (no eggs); $6\times7\frac{1}{2}$ (large number of eggs); $3\frac{1}{2}\times5\frac{1}{2}$ (no eggs); $2\times4\frac{1}{2}$ (many eggs); $2\frac{1}{2}\times4$ (crowded with eggs); $5\frac{1}{2}\times6$ (many eggs); $4\frac{1}{2}\times6$ (many eggs); $4\times4\frac{1}{2}$ (many eggs); $2\frac{1}{2}\times4$ (without eggs).

These data show that the specimens with numerous eggs are the larger ones in which at least one dimension reaches 4 mm. Moreover, when in large specimens no eggs are present in the mantle cavity they may have been recently discharged from this cavity. The data, therefore, give sufficient evidence for the opinion that *L. okadai* reaches its mature state at a stage in which at least in one dimension the body has a size of 4 mm. On the other hand, *L. pusillus* is fully mature at a size of 2 mm.

Summarizing it may be remarked that though the specific characters of *Lernaeodiscus pusillus* may appear unconvincing there is sufficient evidence for regarding the parasite as specifically distinct from the other forms belonging to the genus.

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